4(d) RULE EVALUATION AND RECOMMENDED DETERMINATION

FMEP SUBMITTED BY: Oregon Department of Fish and Wildlife

FISHERIES OR AREA: Oregon's tributary fisheries potentially affecting listed Lower Columbia River chinook salmon.

EVOLUTIONARILY SIGNIFICANT UNIT (ESU): Lower Columbia River chinook salmon (*Oncorhynchus tshawytscha*)

4(d) RULE LIMIT: Limit 4

TRACKING NUMBER: NWR/4d/04/2001/011

DATE:

The Oregon Department of Fish and Wildlife (ODFW) has submitted a Fisheries Management and Evaluation Plan (FMEP) for their tributary fisheries that may affect listed chinook salmon in the Lower Columbia River ESU (ODFW 2003). This plan was submitted for NOAA's National Marine Fisheries Service (NOAA Fisheries) approval under limit 4 of the anadromous fish 4(d) Rule (50 CFR 223.203(b)(4); July 10, 2000, 65 FR 42422) on May 25, 2001. Following public review and subsequent revisions to the FMEP to address comments, a final version of the FMEP was provided to NOAA Fisheries in March 2003. The final draft of the FMEP is being evaluated in this document.

EVALUATION

The 4(d) Rule for the Lower Columbia River (LCR) ESU states that the prohibitions of paragraph (a) of the rule do not apply to fishery harvest activities provided that:

- Fisheries are managed in accordance with a NOAA Fisheries approved FMEP, and
- Fisheries are implemented in accordance with a letter of concurrence from NOAA Fisheries.

NOAA Fisheries can approve an FMEP if it adequately addresses the criteria specified below. The following is an evaluation of whether the submitted FMEP adequately addresses the criteria for limit 4 of the 4(d) Rule for Lower Columbia River chinook salmon.

Limit 4 Criteria and FMEP Evaluation

Clearly defines its intended scope and area of impact

This FMEP addresses all tributary fisheries that affect or could potentially affect listed chinook populations on the Oregon side of the Lower Columbia ESU (Figure 1). The fishery management area is described in section 1.2.1 of the FMEP. Table 1 summarizes the fisheries typically conducted in the action area, and indicates the method of consideration under the ESA. The ocean fisheries undergo section 7 consultation initiated by the Pacific Fishery Management Council. The mainstem Columbia River fisheries undergo section 7 consultation initiated by the parties of *U.S. v. Oregon*. Tributary fisheries on the Washington side of the Lower Columbia River ESU are managed under the sole authority of the state of Washington. Washington Department of Fish and Wildlife has also submitted an FMEP for approval by NOAA Fisheries (WDFW 2003).

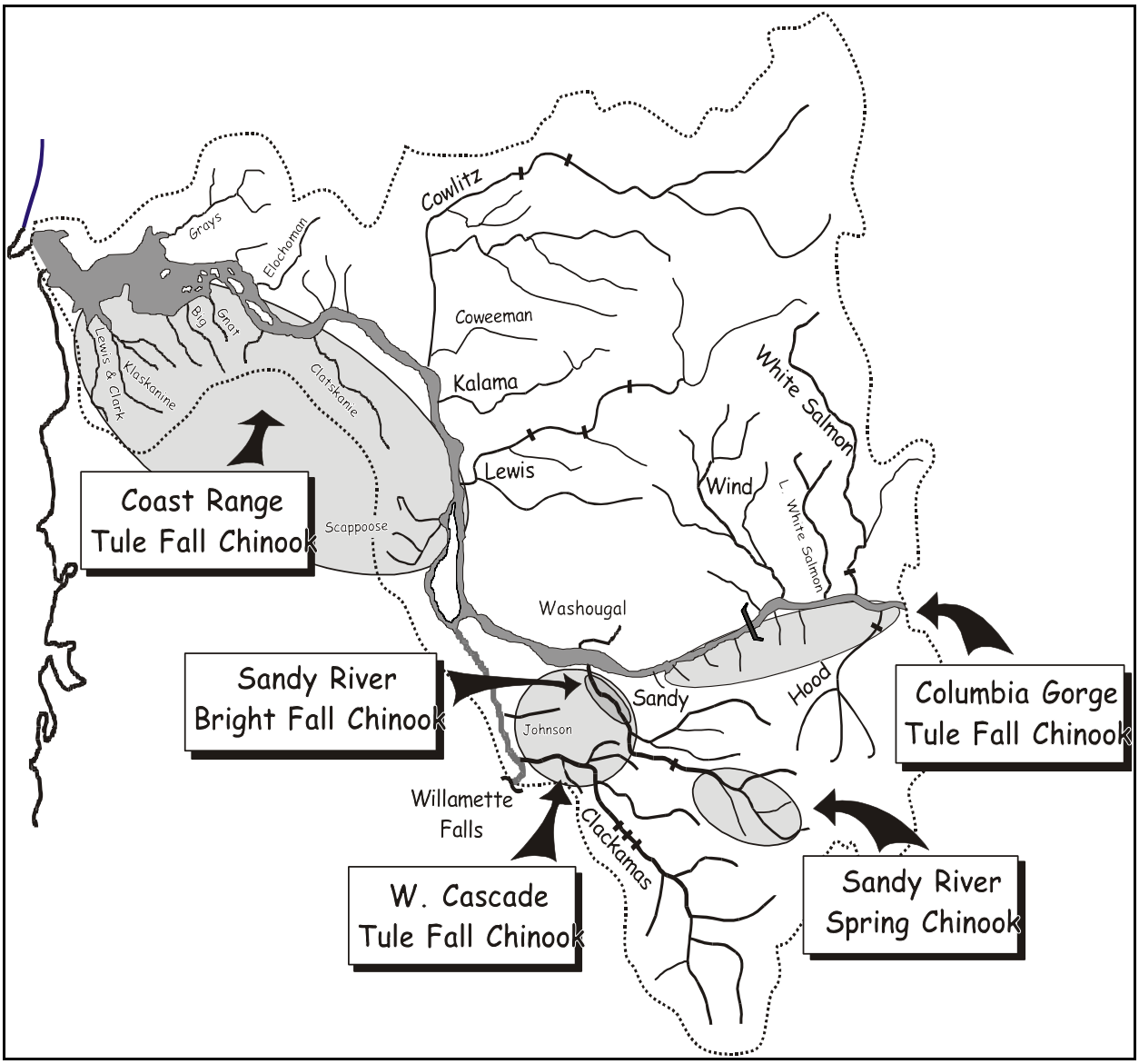

Figure 1. Oregon stocks in the listed Lower Columbia River chinook salmon ESU. Source: FMEP Lower Columbia River Chinook in Oregon Freshwater Fisheries of the Lower Columbia River Tributaries Between the Pacific Ocean and Hood River.

Sets forth the management objectives and the performance indicators for the plan

The LCR chinook salmon FMEP specifies that the overall management intent is to harvest known hatchery-origin spring chinook salmon and natural and hatchery-origin fall chinook salmon and other non-listed fish species present in a manner that does not jeopardize the survival and recovery of the LCR chinook salmon ESU. All spring chinook salmon fisheries included in this FMEP will be managed such that only hatchery-produced adult spring chinook salmon that are

adipose fin clipped may be retained. In the Sandy and Clackamas Rivers, only fin-clipped chinook salmon may be retained (year round). Other tributary fisheries for chinook salmon will be managed so that cumulative harvest from ocean and freshwater fisheries does not exceed Rebuilding Exploitation Rates (RERs) specified in section 7 consultations completed by NOAA Fisheries (NMFS 2000a; NMFS 2000d).

The performance indicators for the management objectives of the LCR FMEP are described in sections 1.1.1 and 3.1 of the LCR FMEP. Included are indicators addressing population parameters and measures of fishery performance. The primary fish population indicators for LCR spring chinook salmon are escapement estimates based on Marmot Dam counts and spawning ground index counts in the upper Sandy River basin. Primary fish population indicators for listed LCR fall chinook salmon are spawning escapement indices based on spawning ground surveys in the Sandy and Clackamas Rivers, in smaller tributaries between the Hood and Sandy Rivers, and in tributaries between Scappoose Creek and Youngs River. Supplemental fish population performance indicators include carcass samples in the upper Sandy River basin tributaries and catch record card estimates. Carcass samples are used to estimate hatchery- to natural-origin fish ratios and age composition so that recruitment rates and natural stock productivity can be estimated.

Performance indicators also include fishery indicators for monitoring fishery performance and regulating impacts within prescribed limits. The primary fishery indicators for LCR tributary chinook salmon sport fisheries are catch record card estimates of total catch by subbasin from voluntary harvest tag returns by anglers.

In addition, NOAA Fisheries evaluates whether the FMEP adequately addresses the following criteria:

4(i)(A) Defines populations within affected ESUs, taking into account: spatial and temporal distribution, genetic and phenotypic diversity, and other appropriate identifiably unique biological and life history traits.

Within the LCR ESU, there are historic runs of three different chinook salmon stocks: spring, early fall "tules", and late fall "brights." Listed Oregon populations include naturally spawned stocks of spring chinook salmon in the Sandy River, bright fall chinook salmon (LRW) in the Sandy River, and tule fall chinook salmon in the Hood, Sandy, and Clackamas Rivers, as well as numerous smaller tributaries of the Columbia River between the mouth and Scappoose Creek.

The FMEP defines the affected populations with the affected ESU. The population designations in the FMEP are consistent with the preliminary population designations developed by the Willamette/Lower Columbia Technical Recovery Team (TRT) (Myers *et al.* 2002). ODFW has aggregated populations into units for management purposes (see Figure 1). The management units designated in the FMEP for the different chinook stocks in the ESU also closely match the ecoregion designations by the TRT, thus taking into account the unique stock differences due to physical, biological, and life history characteristics. Myers *et al.* (2002) cite a strong relationship

between ecoregions and native fish assemblages. Below is a description of the populations and management units managed in the FMEP.

Spring chinook salmon

The Sandy River contains the only spring chinook salmon population in this ESU that continues to support substantial natural production (Meyers *et al.* 1998) and Oregon's only spring chinook salmon population in this ESU. Natural spring chinook salmon production in the Sandy River declined to very low levels prior to 1970 but has rebounded following a hatchery release smolt program in the upper basin using Willamette River stock spring chinook from Clackamas Hatchery (Upper Willamette River chinook salmon ESU). Sandy River's spring chinook spawning areas are located almost entirely upstream from Marmot Dam (river mile (RM) 30).

Naturally spawned populations of spring chinook salmon in the Hood and Clackamas Rivers are not included in the LCR ESU. The current spring chinook salmon population in the Hood River basin was reintroduced from Deschutes River hatchery stock which are included in the unlisted Middle Columbia River chinook salmon ESU (Myers *et al.* 1998). Spring chinook salmon in the Clackamas River are included in the Upper Willamette River chinook salmon ESU. Fisheries affecting Upper Willamette spring chinook are addressed in a separate FMEP titled "Upper Willamette River Spring Chinook in Freshwater Fisheries of the Willamette Basin and Lower Columbia River Mainstem" (ODFW 2001) that was approved by NOAA Fisheries, February 9, 2001.

Early fall "tule" chinook salmon

The Sandy River tule stock has a earlier run timing and a younger age class composition than the bright stock which also occurs in the Sandy River. Natural tule fall chinook salmon historically spawned in most Oregon side tributaries of LCR ESU, but remaining populations are small and either originated or are sustained by hatchery fish (Myers *et al.* 1998). Oregon populations of tule chinook salmon were grouped into management units based on bio-geographical factors and life history differences among stocks within the ESU (Figure 1; ODFW 2003).

The Western Cascade fall chinook salmon management unit includes tributaries upstream of Scappoose Creek, including the Clackamas River and lower Willamette tributaries, to the Sandy River. There are self-sustaining populations of tule fall chinook salmon in the lower Sandy and Clackamas Rivers which are thought to have originated from former hatchery programs in these basins (ODFW 2003). The native fall chinook salmon population in the lower Clackamas River was probably eliminated in the 1930's and 1940's by mainstem Willamette River pollution problems (Myers *et al.* 1998).

The Coast Range fall chinook management unit includes tributaries from Youngs Bay upstream to and including the Scappoose Creek. These drainages are relatively short, low gradient, and have similar geologic properties. Currently, all naturally spawning chinook in these tributaries are tule stock, originating primarily from first generation stray hatchery production (Myers *et al.* 1998). It is unclear if a self-sustaining natural run of fall chinook remains within the population complex or if spawners consist solely of stray hatchery fish. Historically, most of the populations in this area

were probably small or ephemeral due to the combination of early run timing by native tule stock and the typically dry early fall months that restrict water flows during that time (Myers *et al.* 2002).

The Columbia River Gorge fall chinook management unit includes tributaries upstream of the Sandy River to the Hood River. Tule stock fall chinook salmon spawn naturally in the lower Hood River, and most (approximately 80%) are thought to be naturally produced based on scale samples taken from fish at Powerdale Dam (ODFW 2003). The Hood River is the only Oregon basin with enough accessible habitat to support a self-sustaining population of chinook within this management unit (ODFW 2003).

Late fall "bright" chinook salmon

There are currently three populations of bright fall chinook salmon in this ESU, of which only one spawns in Oregon. All LCR bright populations are naturally produced and self-sustaining, with no impacts from hatchery programs (ODFW 2003). The Oregon population spawns in the Sandy River, primarily in the lower mainstem reach between Dabney and Oxbow parks (RM 6-13), although some spawning occurs in tributaries and in upstream areas, including above Marmot Dam (RM 30). The Sandy River bright fall population is genetically distinct from the earlier-spawning tule chinook stock which also spawns in the Sandy River (Marshall *et al.* 1995).

Further information on the population structure throughout the LCR ESU can be found in Section 1.3.2 "Description of the current status of each population relative to its Viable Salmonid Population thresholds."

All of the other listed ESUs in the Columbia basin are either not affected by the fisheries included in this FMEP or impacts of the fisheries will be addressed in other FMEPs or section 7 consultations (Table 1). These other ESUs include Upper Willamette River spring chinook salmon; Lower Columbia River steelhead and chum salmon; Snake River spring/summer chinook salmon, fall chinook salmon, sockeye salmon, and steelhead; Upper Columbia river steelhead and spring chinook salmon; and Middle Columbia River steelhead.

Table 1. Status of ESA coverage for fisheries occurring in the Lower Columbia River management area. Impacts from mainstem Columbia River fisheries affecting all upriver ESUs not listed in the table are addressed in the section 7 consultation on mainstem fisheries (NMFS 2000a). The impacts of ocean fisheries on all listed Columbia Basin ESUs are addressed in section 7 consultations with Pacific Fishery Management Council (see NMFS 2000d).

Area / ESU	Process for ESA Coverage	Status
Ocean fisheries	Section 7 consult.	Completed (April 2001)
Mainstem Columbia River fisheries	Section 7 consult.	Completed (March 2001)
Lower Columbia chinook		
Oregon tributary fisheries	FMEP	In review
Washington tributary fisheries	FMEP	In review
Lower Columbia steelhead		
Oregon tributary fisheries	FMEP	In review
Washington tributary fisheries	FMEP	In review
Columbia chum	FMEP	In review
Upper Willamette spring chinook	FMEP	Completed (Feb. 2001)
Upper Willamette steelhead	FMEP	Completed (Nov. 2001)

4(i)(B) Uses the concepts of ‘‘viable’’ and ‘‘critical’’ salmonid population thresholds, consistent with Viable Salmonid Populations (VSP) concepts in “Viable Salmonid Population.”

The regulations in the 4(d) Rule state that an FMEP must use the concepts of “viable” and “critical” thresholds (see McElhany *et al.* 2000) in a manner such that fishery management actions: (a) recognize significant differences in risk associated with viable and critical population threshold states; and (b) respond accordingly to minimize long-term risks to population persistence. Harvest actions that impact populations at or above viable threshold must maintain the population or management unit at or above the viable level. Impacts on populations above critical levels but not at viable levels (demonstrated with high degree of confidence) must not appreciably slow achievement of viable function. Impacts on populations functioning at or below critical threshold must not appreciably increase genetic and demographic risks facing the population and must be designed to permit achievement of viable functions, unless the FMEP demonstrates the likelihood of survival and recovery of the entire ESU in the wild would not be appreciably reduced by greater risks to an individual population.

Two general harvest approaches are being proposed in the LCR chinook FMEP. The first approach is to manage fisheries to allow only fin-clipped, hatchery chinook to be retained by anglers. Permanent regulations are in place for the Sandy and Clackamas rivers permitting only the harvest of hatchery fish. All wild fish must be released unharmed. The second approach is to manage cumulative impacts from ocean and inriver fisheries so as to not exceed the Rebuilding Exploitation Rates (RERs) specified by NOAA Fisheries in section 7 consultations with PFMC and parties of *U.S. v. Oregon*. This management regime pertains primarily to tule fall chinook stocks in the Coast and Columbia River Gorge Management Units. These RERs are periodically revised and considered in section 7 consultations. The FMEP states that any new RERs developed will be incorporated in the management regime of the tributary fisheries so that total fishery impacts do not exceed the specified RER limits.

The FMEP specifies critical and viable threshold abundance levels for each of the management units on the Oregon side of the Lower Columbia chinook ESU. After reviewing the available information used to derive these thresholds, there is a lot of uncertainty regarding the status of many of these stocks and the credibility of the critical thresholds. There was insufficient information available to assess if the critical abundance thresholds were adequate to avoid substantial risks to population survival and persistence if the management units decrease below the critical levels unexpectedly. The FMEP states that if a management unit drops below the critical abundance levels, additional fishery limitations will be considered to reduce fishery impacts on wild populations. Fishery restrictions may involve a combination of time and area closures, reduced bag limits, and quotas as necessary. The tule stock in the Hood River has been near or below the critical abundance level. Harvest of this stock still occurs in mixed stock fisheries in the ocean and mainstem areas.

NOAA Fisheries' "Viable Salmonid Populations and the Recovery of ESUs" document (McElhany *et al.* 2000) describes four key parameters for evaluating the status of salmonid populations. These parameters are population size (abundance), population growth rate (productivity), spatial structure, and diversity. The LCR chinook salmon FMEP describes critical abundance threshold levels for all management units on the Oregon side of the ESU (Table 2). Viable threshold levels are specified for the Sandy Basin populations. These thresholds were designated as preliminary because biological information is limited. It is anticipated that as more information and analyses become available, the thresholds will be revised as necessary. Recovery planning efforts are currently underway by the Technical Recovery Team. The information produced by the TRTs will be incorporated into the into the comprehensive review process for this FMEP. This adaptive management approach is consistent with the guidelines provided in the VSP technical document (see page 30 of McElhany *et al.* 2000). Below is an evaluation of whether the FMEP adequately addresses the VSP parameters for LCR chinook salmon.

Table 2. Critical abundance thresholds identified in the LCR chinook salmon FMEP. (All values are naturally spawning adults per year except for values for tule fall chinook salmon which are natural or hatchery spawners per year. * The recent average for the Western Cascade tule fall chinook population is based on a 3-year average).

Natural Populations (or Management Units)	Critical Adundance Thresholds	Viable Abundance Thresholds	Recent 5-Year Average	Associated Hatchery Stock(s)	Hatchery Stocks Necessary For Recovery? (Y/N)
Sandy spring chinook salmon	300	2000 or average spawner numbers of at least 50% of basin capacity based on MSY escapement level	2,598	Clackamas Sandy	No No
Sandy bright fall chinook salmon	300	1500 or average spawner numbers of at least 50% of basin capacity based on MSY escapement level	840	None	NA
Western Cascade tule fall chinook	600		455*	None	NA
Coast Range tule fall chinook salmon	600		1767	Various	No
Columbia River Gorge tule fall chinook salmon	300		21	Spring Cr	NA

Population Size

Critical abundance threshold levels were specified for all of the harvest management units (Table 2). There was sufficient information available to specify viable levels only for chinook stocks in the Sandy Basin. See section 4(i)(A) above for further information on chinook salmon populations in the LCR.

The critical abundance thresholds were based on a review of the conservation biology literature (McElhany *et al.* 2000). Spawner numbers of 300 or greater appear sufficient to avoid short-term deleterious genetic and demographic effects. Recently the Columbia River Gorge tule fall chinook stocks have not met the specified critical threshold levels (Table 2).

As previously stated, these thresholds were designated as preliminary because biological information is limited. Viable threshold limits for the spring and bright fall chinook in the Sandy Basin were based on the average spawner number of at least 50% of the subbasin capacity. Capacity was estimated as spawner abundance at maximum sustainable yield (MSY). Interpretation of escapement data for tule fall chinook has been confounded by the effects of hatchery fish, so ODFW followed a recommendation by NMFS (2000c) to use escapement levels required to achieve MSY exploitation rates as an alternative to more comprehensive population modeling in cases where data were inadequate. The FMEP states these thresholds will be revised as more information and analyses become available (including work to be completed by the TRT).

Population Growth Rate

Section 1.3.1 and table 2 of the FMEP specify the critical and viable thresholds for population growth rate, or productivity. The critical thresholds for productivity for all of the natural populations in the LCR ESU are abrupt declines in escapement (>50% in one year) relative to recent-year averages or short term average replacement rate (3 year average recruits per spawners) projected to result in less than the critical number of spawners (300 or 600 fish, as stated above) within three years. If any one of the populations drops to the critical thresholds for productivity, further fishery restrictions will be considered as specified in section 3.5.1 of the FMEP (see also section D below).

The viable thresholds for productivity are defined as: in the short-term, a generally increasing trend in escapement; and for the long-term, an average replacement rate equal to one. If the populations meet these viable thresholds, the populations would not be declining over the long term.

Spatial Structure

It is possible for fisheries to affect the spatial structure of a population and/or ESU. For example, a fishery could target a certain portion of the run, which may result in a substantial decrease in the number of spawners destined for a particular spawning location. The early portion of a run of salmon may be the fish that migrate the farthest upstream. If the fishery only harvests the early returns, the spawning distribution of a population may change.

Based on NOAA Fisheries' assessment of the potential impacts from the tributary fisheries on the spatial structure of any chinook population, the fisheries as described in the FMEP are not expected to adversely affect this VSP parameter for the following reasons. Many of the tributaries are closed to fishing for chinook salmon. Fishery impacts on these populations will be primarily associated with anglers incidentally catching a chinook while angling for other fish species. Harvest regulations in the Clackamas and Sandy Rivers (the two largest basins on the Oregon side of the ESU) require catch and release of unmarked, wild chinook year round. There are some impacts of these catch and release fisheries. However, the impacts will likely be spread throughout the breadth of the run. The area of most concern would be in the Sandy River below Marmot Dam. There may be a higher impact from fisheries on this portion of the spring chinook population because they are holding in an area open to fishing throughout the summer. These fish

are more susceptible to being caught multiple times, thus likely exhibiting a higher mortality rate compared to the fish that migrate above Marmot Dam and over summer in an area that is closed to salmon angling. Impacts on listed spring chinook are expected to be low because the majority of the spring chinook below Marmot Dam are hatchery fish and because natural fish continue to cross above Marmot Dam through out the summer months. Lastly, in the rivers where tule fall chinook can be harvested (primarily the coastal tributaries where hatchery fish are released), any spatial structure effects from fishing would likely occur at the early part of the spawning run since anglers have a tendency to target these fish when they first enter the tributaries when stream flows are low.

The loss of historic habitat from the construction of dams and habitat degradation has contributed to the loss of the spatial integrity of chinook salmon populations more than any other factor that may affect the spatial structure of a spawning population. Most of the available spawning and rearing areas are degraded with altered flows and water quality based on the streams currently on the Oregon Department of Environmental Quality 404(d) list (*http://www.deq.state.or.us/wq/WQLData/SelectBasin98.asp*, as of June 12, 2003). Fisheries considered in this FMEP are not expected to contribute to these problems.

Diversity
As stated above, actions described in the FMEP will not likely affect within- and among-population diversity of the ESU. As stated in the Spatial Structure assessment above, some of the fisheries are more likely to affect a population's diversity more than some of the other fisheries. Diversity parameters are most likely influenced by habitat and hatcheries in the case of LCR chinook salmon (Myers *et al.* 1998).

4(i)©) Sets escapement objectives or maximum exploitation rates for each management unit or population based on its status, and assures that those rates or objectives are not exceeded.
The objectives of the FMEP for Oregon's tributary fisheries is to harvest known, hatchery-origin spring chinook, natural and hatchery fall chinook, and non-listed fish species in a manner that does not jeopardize the survival and recovery of the listed LCR chinook ESU. All spring chinook salmon fisheries will be managed such that only hatchery-produced adult spring chinook that are adipose fin clipped may be retained. The tributary fisheries for fall chinook salmon will be managed to meet natural and hatchery escapement goals or be limited by total impacts from all fisheries including those that occur in the Pacific Ocean and mainstem Columbia River. The RERs specified by NOAA Fisheries in completed section 7 consultations for ocean and mainstem Columbia fisheries will be used to limit cumulative harvest rates on LCR chinook stocks. During pre-season negotiations, the fisheries will be designed as to not exceed the RER for the appropriate stocks. In-season monitoring of the estuary and mainstem Columbia River fisheries will determine if fishing effort needs to be reduced so that the RER is not exceeded. Fisheries in the tributaries will be further restricted if necessary to keep total mortality rates below the RER.

Spring chinook salmon

Only hatchery fish can be retained in the Sandy River (the only tributary fishery in the management area of the FMEP affecting native spring chinook). All naturally produced spring chinook salmon will be released. The overall mortality rate for catch and release fisheries depends on the encounter rate of natural fish (percentage of the run that is actually caught and released) in the fisheries, the mortality rate associated with being caught and released (hook-and-release mortality), and the illegal harvest of wild fish. The FMEP estimates the mortality rate from the selective fishery in the Sandy River to average 4.2% and establishes a maximum exploitation rate of 6.1% (Table 8 of the FMEP). The FMEP states selective fisheries for hatchery fish only will remain in place even if the wild run recovers to viable threshold levels.

Early fall "tule" chinook salmon

Since there are numerous tule fall chinook stocks in Oregon tributaries, management is more complicated and exploitation rates vary depending on the area and status of the wild populations. There are two general fishery management frameworks specified in the FMEP for tule fall chinook. The management framework that is applied to a specific tributary is dependant on the status of the natural spawning population and the presence of hatchery tule fall chinook salmon. The first framework is to essentially eliminate harvest of fall chinook by closing the tributaries during the period of peak return and spawning of adults or by prohibiting any retention of wild chinook while angling for other species such as hatchery coho salmon and steelhead. Most of the rivers within this framework are the areas that are known to have some natural production of fall chinook. Fishery impacts on fall chinook in these areas are either non-existent because no angling is permitted, or are low impacts (<2%) because the fisheries target species other than chinook (ODFW 2003).

The second management framework allows some harvest of fall chinook in the tributaries. Most of the rivers that allow fall chinook to be harvested are areas where hatchery chinook return and the indigenous population is estimated to be extinct (Table 3). The maximum exploitation rates for these tributaries is defined by the RERs for ocean and mainstem Columbia fisheries. Impacts from tributary fisheries must not exceed the RERs, including impacts from other fisheries outside of the tributaries.

Table 3. Current status of the historical demographically independent populations of tule fall chinook salmon along the Oregon side of the LCR chinook ESU. Population designations were made by Myers *et al.* (2002), as part of the LCR/Willamette Technical Recovery Team's work.

Historical Populations (Oregon side)	**Current Status** Quotes from Myers *et al.* (2002)	**Fall Chinook Fishing Season**
Youngs Bay	"unlikely that there are any remaining distinct spawning aggregations of native chinook salmon" appendix C pg. 3	Open
Big Creek	"unlikely that much of the native population is represented by the existing hatchery or naturally spawning population" appendix C pg. 4	Closed September
Clatskanie River	"majority of these fish appear to be first generation hatchery strays" appendix C pg. 5	Open
Scappoose Creek	Status uncertain. "Hatchery introductions and strays have probably had a substantial influence on the native population" appendix C pg. 6	Closed
Clackamas River	"run appears to be maintained through natural reproduction." appendix C pg. 10	No retention wild chinook.
Sandy River	"suggested....that the early returning fall-run (tules) are the descendants of hatchery releases from LCR hatcheries" appendix C pg. 12	No retention wild chinook.
Lower Gorge tributaries	"little suitable spawning habitat for chinook,...(spawners) observed in these tributaries are hatchery fish released from Bonneville Pool Hatchery programs" appendix C pg. 13	Closed
Upper Gorge tributaries	"little suitable spawning habitat for chinook,...(spawners) observed in these tributaries are hatchery fish released from Bonneville Pool Hatchery programs" appendix C pg. 13	Closed
Hood River	"very small spawning aggregation...remains in the Hood River basin. Hatchery releases directly into the Basin have been very limited" appendix C pg. 15	Open

Late fall "bright" chinook salmon

The Sandy River has the only late fall "bright" chinook population on the Oregon side of the LCR ESU. The permanent fishing regulations adopted by ODFW prohibit the retention of unmarked "bright" fall chinook in the Sandy River. Returning fall chinook will be handled in fisheries targeting other species such as hatchery coho salmon and steelhead. The FMEP specifies a maximum fishery impact rate of 3.8% on Sandy River brights. The Sandy River closes to salmon angling beginning November 1st through the end of January.

4(i)(D) Displays a biologically based rationale demonstrating that the harvest management strategy will not appreciably reduce the likelihood of survival and recovery of the ESU in the wild, over the entire period of time the proposed harvest management strategy affects the population, including effects reasonably certain to occur after the proposed actions cease.

The assessment of impacts from Oregon's tributary fisheries on listed LCR chinook is described in section 2 "Effects on ESA-listed Salmonids" of the FMEP (ODFW 2003). NOAA Fisheries has also assessed the merits of the FMEP in protecting and recovering listed chinook salmon. Below is a summary of the key findings for each of the three runs of chinook in Oregon's tributaries of the LCR ESU.

Spring chinook salmon

In the Oregon tributaries of the LCR ESU, the only native spring chinook salmon population is in the Sandy River Basin. The Willamette River (also an Oregon tributary within the geographic boundaries of the LCR) has a spring chinook run but it was determined to be a separate ESU (Myers *et al.* 1998). Fisheries affecting Willamette spring chinook are governed by a separate FMEP approved by NOAA Fisheries in February 2001 (ODFW 2001). ODFW has proposed to manage the spring chinook fishery in the Sandy River to allow the retention of only fin-clipped, hatchery chinook salmon. All unmarked, wild spring chinook are required to be released unharmed by anglers.

By implementing a selective fishery for hatchery spring chinook in the Sandy Basin, impact rates are estimated to be reduced by over 85% from historical levels. Prior to selective fishing being implemented in 2002, harvest rates on naturally produced spring chinook in the Sandy River were approximately 40%. In 2002 and beyond, under the selective fishing regulations, impacts on naturally produced chinook are expected to be in the range of 4.2% to 6.1% per year (ODFW 2003). Reducing fishery impacts on this naturally produced spring chinook population by an order of magnitude is expected to provide recovery benefits by increasing the number of natural spawners. The counts of spring chinook at Marmot Dam on the Sandy River have been steadily increasing since the early 1980's even under a constant harvest rate of approximately 40%. It is anticipated that counts of spring chinook will increase substantially from the reductions in fishery mortality to 4% to 6% annually.

Table 4. Results of a quantitative Population Viability Analysis risk assessment of fishing impacts on wild Sandy River spring chinook based on worst case estimates of population productivity and capacity.[1] Source: Fisheries Management and Evaluation Plan for Lower Columbia River Chinook in Oregon Freshwater Fisheries of the Lower Columbia River Tributaries Between the Pacific Ocean and Hood River.

	Quasi-extinction Risk [2]	Large Run Probability [3]	"Recovery" Probability [4]	Equilibrium Escapement [5]
Planned vs. historic fishing rates				
Standard [6]	***< 1%***	***> 10%***	***> 50%***	***2,000***
FMEP rate (8.6%)	< 0.1%	46%	97%	3,500
1984-2000 avg. (48%)	2%	3%	1%	850
Other fishing rates				
No fishing	< 0.1%	54%	99%	4,000
15% average annual rate[7]	< 0.1%	38%	90%	3,200
30% average annual rate[8]	< 0.1%	20%	50%	2,100

[1] *Worst case assumptions are represented by low inherent stock productivity (Ricker a = 0.7), strong depensation at escapements of less than 300, average smolts per spawner of 68.0, average smolt to adult survival of 1.67%, average ocean fishing rate of 12%, and stochastic variation in fishing rates, freshwater survival, and ocean survival (ODFW 2000).*

[2] *Quasi-extinction risk based on the frequency of wild escapement of less than 300 fish within 30 years.*

[3] *Large run probability based on frequency exceeding 75% of replacement abundance within 30 years (i.e. 3,000 spawners).*

[4] *Based on last 8-year average run size exceeding interim subbasin plan goal (2,000 fish past Marmot Dam) which for purposes of this exercise is assumed to represent 50% of the basin capacity which we defined as replacement abundance in the Ricker stock-recruitment equation (i.e.4,000 spawners).*

[5] *Average run size during last 8-years of simulation.*

[6] *Standards are recommended as benchmarks for comparative purposes.*

[7] *FMEP rate identified for spring chinook in upper Willamette River basin populations.*

[8] *Rate at maximum sustained yield for Sandy River population based on worst case productivity assumptions.*

ODFW conducted a Population Viability Analysis (PVA) for spring chinook in the Sandy River. Under the selective fishery regime, it was estimated that the probability of falling below 300 spawners in 30 years was less than 0.1% (Table 4). Under the historic fishing impact levels, the probability of falling below 300 spawners was estimated to be 2%. The probability for meeting the specified "recovery" and "large run" criteria under the new selective fishing regime are higher than for historic harvest rates (Table 4).

Based on the above information, the impacts from fishing are substantially reduced under the FMEP for the population of spring chinook in the Sandy River Basin. The outlook for conserving and recovering this population is much improved compared to the past harvest management with the probability of the "recovery" (as defined in Table 4) increase from 1% under past management to 97% under the proposed changes. Thus, the proposed fisheries will not appreciably reduce the likelihood of survival and recovery of the listed spring chinook population in the Sandy River.

Early fall "tule" chinook salmon

It has been extremely difficult to evaluate the fisheries management regime proposed in the FMEP for the early fall tule stocks of chinook on the Oregon side of the LCR ESU. Every native tule chinook population on the Oregon side of the ESU has been altered from its historic state by hatchery programs, high harvest rates in fisheries, habitat loss, and habitat degradation. Myers *et al.* (2002) describes that most of the native tule populations in this area are probably extirpated or do not represent the native genetic lineage that occurred historically (Table 3). In addition, hatchery programs in the Lower Columbia have released large numbers of fish from non-indigenous stocks for over 50 years in most of these rivers. The vast majority of these hatchery fish (>95%) have not been marked, so it is impossible to differentiate between hatchery- and natural-origin fish spawning in the tributaries (NMFS 2000b). These hatchery practices have masked, and continue to mask, the true status of any remnant runs of tule fall chinook throughout the ESU. Lastly, tule fall chinook are subjected to very high harvest rates in ocean and freshwater fisheries. These fisheries are designed to harvest abundant hatchery chinook and healthy stocks of chinook returning to the Oregon Coast, Washington Coast, and the Hanford Reach of the Columbia River. Because the tule stocks commingle with most of these other stocks, the tules are subjected to intense harvest regimes in these mixed stock fisheries. These are some of the issues that have made the assessment of the impacts of tributary fisheries difficult.

The discussion of the above issues is not intended to diminish the importance of conserving and recovering tule stocks throughout the ESU. These populations are listed under the ESA. However, evaluation of the tributary fisheries must be put in the context of the other key factors outside of the scope of ODFW's FMEP. This FMEP is not going to result in much improvement to the long-term health of the tule chinook populations in the LCR ESU because of the other larger factors; even if all tributary fisheries were closed, runs would continue to remain low, (see table 5 for the proportion of fall chinook caught in the tributaries compared to the Lower Columbia River). Substantial reforms of hatchery management will have to be accomplished, which will largely take place through section 7 consultations between the hatchery operators and NOAA Fisheries. Any changes to harvest management to help protect tules will likely occur via section 7 consultations with PFMC for ocean fisheries and the parties of *U.S. v. Oregon* for estuary and mainstem Columbia River fisheries.

Impacts on tule fall chinook from the tributary fisheries varies substantially depending on the river. Based on the catch card returns from 1985 to 1998, Big Creek has recorded the highest catch of fall chinook of any of the Oregon tributaries in the LCR ESU (Table 5). Impact levels in the Sandy River below Marmot Dam were the second highest. All the other tributary fisheries reported relatively low harvest of fall chinook. The Lower Columbia River contains by far the largest fishery for fall chinook, with more than 85% of the total catch reported coming from this fishery. The Lower Columbia River fisheries are outside the scope of this FMEP. Mainstem fisheries are governed by section 7 consultations between NOAA Fisheries and the parties of *U.S. v. Oregon*. However, as described above, mainstem impacts are included in the FMEP management regime and this analysis through application of total RERs as a management standard.

There are two fishery management regimes proposed in the FMEP for tule fall chinook. The first regime is to prohibit any harvest of wild tule chinook in the tributaries. This is accomplished by prohibiting angling during the period when peak spawning of tules occurs in the tributaries (i.e. Big Creek, Scappoose Creek, Columbia River Gorge tributaries) or by prohibiting any harvest of wild chinook year round (i.e., in the Clackamas and Sandy Rivers); see Table 3 for further information on the fishing seasons in all of the management units. In these tributaries, fishery impacts on fall chinook are non-existent during the fishing closures, or low (likely much less than 2%) because impacts are primarily from fish being caught and released and possibly from non-compliance. The catch and release mortality fisheries are in the Clackamas and Sandy Rivers. The fisheries when tule fall chinook are present in these rivers have very low effort because no finclipped chinook are present in the fall, so harvest opportunities do not exist. The Sandy River also closes October 1st to chinook salmon angling. Fishing pressure after this closure reduces substantially to a few anglers targeting hatchery steelhead in between the summer and winter runs that normally peak in June and January, respectively..

For the remaining tributaries that allow fall chinook to be harvested, the fisheries will be managed as to not exceed Rebuilding Exploitation Rates (RERs) determined by NOAA Fisheries. The RERs are a maximum fishery mortality rate for ocean and freshwater fisheries. The co-managers are required (via section 7 consultation terms and conditions) to manage the ocean and mainstem fisheries so that the RERs are not exceeded for the specified stocks. The FMEP will also adopt the RER management regime for the tributaries that allow some harvest of tule chinook.

Data on LCR fall chinook salmon is insufficient for a formal risk assessment based on PVA. As a result, ODFW has adopted the RER established by NMFS for LCR tule fall chinook salmon fishery impacts that occur in fisheries regulated by the PFMC (NMFS 2002, Simmons 2002). The rebuilding exploitation rate, by definition, does not appreciably reduce the likelihood of survival and recovery of these fish. There are four steps involved with determining population specific RERs: (1) identify populations, (2) set critical and viable abundance levels, (3) estimate population productivity as indicated by a spawner-recruit relationship, and (4) identify appropriate RERs through simulation. The RER for tule fall chinook salmon was set at 49% in 2002 (this is a reduction from 65% used in 2001). As seen with the recent change, the RER is subject to change as new recruitment data is incorporated into the models. The tributary fisheries will be managed according to the most recent RERs determined by NMFS for the PFMC in the North of Falcon process.

Stock-specific RERs have not been determined for all of the tule stocks in the LCR ESU. The only RER developed thus far for tule fall chinook in the LCR ESU is for the Coweeman River stock in Washington. Since little or no stock-recruit data is available for the other tule stocks in the ESU, the Coweeman stock RER has also been applied to the management of other tule stocks in the LCR ESU. The intent is to develop more stock-specific RERs in the future, but until then, the Coweeman RER will be applied to the other tule stocks.

NOAA Fisheries believes that using the Coweeman stock RER for the management of other tule stocks in the ESU is not ideal. The Coweeman stock occupies a relatively small basin, but the

population there is moderately healthy and self-sustaining and there is little influence from hatchery fall chinook. This stock is being used as an indicator stock for naturally produced LCR tule fall chinook salmon because of the long trend in escapement data and because of the minimal influence of hatchery fall chinook salmon spawners. This population may not be representative of all the tule populations in the LCR ESU, but if the RER for the Coweeman fall chinook salmon population is achieved then it can be expected that there would be adequate protection for the other natural tule fall chinook salmon populations. The Coweeman fall chinook population does represent those tule fall chinook salmon populations in the ESU that are not influenced by hatchery fish (i.e., Grays River fall chinook) and are self sustaining. However, it does not represent those smaller tule populations that are not as productive (i.e., gorge tributary populations). For these populations, fisheries impacts on fall chinook salmon are minimized by area closures, modified seasons and limited to impacts from catch and release during fisheries targeting other species. In the future, as more RERs are developed and refined, the FMEP will adopt those RERs into the management of the tributary fisheries (Table 8 of the FMEP). As described above, ODFW will monitor the performance indicators for the management objectives and these will be used to collect the data necessary to develop future RERs.

The approach of using RERs to guide tule fall chinook impacts in Oregon tributaries appears to be prudent now for the following reasons:

- The tributaries that allow fall chinook to be harvested are dominated by hatchery-origin returns (Table 3; Myers *et al.* 2002).
- The harvest of fall chinook in these tributaries is low and represents far less than 10% of the total harvest in ocean and mainstem Columbia fisheries (Table 5). The notable exception is the Hood River. Available information suggests a remnant population of natural-origin tule chinook still exists in the Hood River (Myers *et al.* 2002; ODFW 2003). However, it is not clear how many of the presumed natural-origin fish may be strays from the Spring Creek Hatchery fall chinook releases which are not marked. This hatchery is located very close to the Hood River and it is very likely that hatchery fish would stray into the Hood River. Catch card information reports a relatively low number of fall chinook harvested (19 fish from 1985 to 1998) in the Hood River (Table 5). More recent estimates show a sharp decline in the number harvested to zero in 2000 and 2001 and 2 adult chinook retained in 2002. However, given the low average escapement of 20 fish to Powerdale Dam from 1992 to 1999 (Table 7 of the FMEP), even a low number of harvested fish harvested represents a substantial percentage of the population returning to this tributary.
- The RERs are the basis for the management of all fisheries because they incorporate all fisheries mortality, including ocean and Columbia River mainstem sport and commercial fisheries. NOAA Fisheries, using the RERs through the PFMC process, can ensure that impacts on LCR tule fall chinook are balanced throughout all the fisheries.

The FMEP does not propose to close angling in the Hood River during the period of return for tule fall chinook. However, ODFW, after discussions with NOAA Fisheries, has proposed to change the regulations in the Hood River Basin to a marked only fishery for chinook salmon. These regulation changes will be implemented in 2004. ODFW agreed with NOAA Fisheries' position that the tule chinook population in the Hood River basin is important to the recovery of the ESU.

Table 5. Sport catch of fall chinook salmon in Oregon tributaries of the Columbia River system, 1985-98 (1997-98 is the last year data is available) (numbers of fish). Source: ODFW (2003). The lower Columbia River fishery is authorized via section 7 consultations with the parties of *U.S. v. Oregon*.

	Run Year												
Stream	**1985-86**	**1986-87**	**1987-88**	**1988-89**	**1989-90**	**1990-91**	**1991-92**	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**
Bear Creek (Clatsop Co)	98	0	0	19	0	6	3	3	8	3	3	0	12
Big Creek (Clatsop Co)	585	318	412	1,000	993	494	369	521	513	326	957	1,001	592
Clackamas River, Lower	81	49	82	66	112	48	107	117	69	50	99	102	147
Clatskanie River	8	26	63	31	19	19	6	0	0	6	30	20	0
Columbia River, Lower	2,513	6,380	16,437	17,540	11,953	5,758	9,070	5,342	6,311	405	3,529	11,663	15,579
Gnat Creek (Clatsop Co)	133	217	1,461	906	840	79	46	28	26	9	0	20	13
Herman Creek	0	0	0	0	0	6	40	6	12	9	12	17	6
Hood River	12	15	20	16	7	6	3	10	0	19	70	13	56
Klaskanine River	72	47	83	262	135	9	21	0	20	24	22	10	62
Lewis and Clark River	75	23	223	172	94	3	15	3	8	0	0	3	6
Sandy River Below Marmot Dam	185	305	735	481	549	282	420	244	406	28	410	387	473
Scappoose Creek	0	0	0	0	0	0	0	0	0	0	0	10	0
Willamette River, Lower	48	36	20	58	93	83	117	20	65	51	119	62	67
Youngs River & Bay	4	0	10	31	7	0	0	0	0	6	0	21	64

Late fall "bright" chinook salmon

The only late "bright" fall chinook stock on the Oregon side of the LCR ESU returns to the Sandy River. This run of fall chinook returns later in the year than tule chinook. In the Sandy River, the late fall bright run returns primarily in September and October and spawns throughout December and January (Myers *et al.* 2002). Fishing regulations in the Sandy River have been reformed in recent years to help protect naturally spawning fall chinook. No harvest of unmarked, wild fall chinook is allowed year round. Since no hatchery fall chinook are released into the Sandy Basin, fishing for fall chinook has been eliminated. All of the fishery impacts on fall chinook now result from being caught and released by anglers targeting other fish species in the lower river-primarily hatchery coho salmon and summer steelhead. The fishing season for coho salmon ends October 31st. No fishing for coho or chinook salmon is allowed during the peak spawning period of Sandy River brights in December and January. Since this time period is in between the peak returns of summer and winter steelhead, fishing effort is relatively low while the brights are spawning in the lower Sandy River. Incidental catches of fall chinook are low during this season (ODFW 2003).

ODFW estimated the Sandy River recreational fisheries resulted in an impact rate on late fall brights in the range of 2 to 4% (ODFW 2003). These estimates assumed fall chinook angling still occurred and thus represent a high end estimate, since fall chinook angling has essentially been eliminated in 2003. Nearly all of the fishery impacts in freshwater occur from fisheries in the mainstem Columbia River. Mainstem Columbia River fisheries are governed by section 7 consultations between NOAA Fisheries and the parties of *U.S. v. Oregon*. Based on the above regulation changes and assessment above, fisheries occurring in the Sandy River will not appreciably reduce the likelihood of survival and recovery of the late fall bright stock of chinook in the Sandy River.

4(i)(E) Includes effective (a) monitoring and (b) evaluation programs to assess compliance, effectiveness, and parameter validation

Section 3 (Monitoring and Evaluation) of the FMEP provides a more detailed explanation of the monitoring programs throughout the basin. Chinook salmon escapement is monitored at Marmot Dam where fish are sorted and adipose fin clipped fish are removed. Spawning ground surveys are conducted by ODFW on most LCR tributaries in the LCR chinook salmon ESU to estimate spawner numbers and hatchery/natural fish ratios. Surveys also record live fish, carcasses, and redds. Snouts are removed from adipose fin clipped fish and analyzed for coded wire tag (CWT) recovery and decoding. Biological data including fork length, sex, and scales are also collected from a random sample of carcasses. These data are used to determine length frequency, and sex and age composition of the returning adults.

Catch record cards are used to determine total catch of each run annually. However, the analysis of catch card returns takes at least two years for the data to be published. Catch card data from most of the fall chinook retention fisheries is the only index of tributary harvest. There is no real

time monitoring in place to close the tributary fisheries if harvest becomes too high. Since the retention fisheries over the past decade have contributed a low proportion of the total cumulative harvest on these stocks, it is likely the risks from not having harvest data in a more timely fashion are fairly low. Harvest of the fall chinook in the tributaries has been relatively low and stable for the years on record (Table 5).

In addition to the monitoring programs discussed in the FMEP, there are numerous other ongoing projects funded by other agencies or programs which provide additional information useful for fisheries management. The Biological Assessment for the operation of hatcheries funded by NOAA Fisheries under the Columbia River Fisheries Development Program (NMFS 2000b) includes many monitoring tasks associated with evaluating hatchery fish on the natural spawning grounds and assessing the percentage of natural fish collected at hatchery facilities.

4(i)(F) Provides for (a) evaluating monitoring data; and (b) making any revisions of assumptions, management strategies, or objectives that data show are needed will be made

As explained in sections 3.5.1 and 3.5.2 of the FMEP, ODFW will evaluate the monitoring data on an annual basis. These reports will be provided to NOAA Fisheries and will include biological and fishery information from the previous year for the information available at that time. In addition, a comprehensive review of the FMEP is scheduled to occur in 2005 to evaluate whether the fisheries and natural populations are performing as expected. Comprehensive reviews will be repeated at 5-year intervals thereafter until such time as the natural stocks are recovered and delisted. The comprehensive reviews will allow management assumptions to be further verified and allow new information or findings to be incorporated into the FMEP. This includes the determinations from formal recovery planning efforts by the Technical Recovery Teams.

One likely change will be from the decommissioning of Marmot and Little Sandy Dams beginning in 2007. This decision has already influenced hatchery management in the Sandy River subbasin. A new hatchery broodstock is being developed for spring chinook from the local, indigenous stock. In previous years, Clackamas River spring chinook (an out of ESU stock) was released into the Sandy River. ODFW and NOAA Fisheries will remain actively involved with the process that drives the decisions on fish passage management issues in the basin, and the appropriate parties will consult with NOAA Fisheries on these issues as they arise. It is not useful to describe management response to this action at this time, as the type and magnitude of effects is only broadly predictable. Because this action is intended to improve the status of the natural spawning populations in the Sandy River subbasin, additional opportunities for fishery harvest will likely be identified; any substantial changes in harvest in the subbasin and their likely effects on listed species will be evaluated at that time.

4(i)(G) Provides for (a) effective enforcement, (b) education, ©) coordination among involved jurisdictions.

The enforcement program is described in section 3.4 of the FMEP. The Fish and Wildlife Division of the Oregon State Police works in close partnership with ODFW to develop enforceable regulations to achieve fish and wildlife resource goals. Enforcement activities in the LCR ESU are conducted from offices in Astoria, Scappoose, Portland, and The Dalles. Troopers develop tactical plans to address priority issues and gain desired compliance levels to protect resources and meet management goals. The results of each tactical plan are quantified and compared to the compliance level considered necessary to meet management goals. Compliance is typically estimated based on the percentage of angler contacts where no violations are noted. Tactical plans are adjusted if necessary based on compliance assessments to make the best use of resources in manpower and equipment to achieve the goals.

The FMEP describes measures taken to inform and educate the public about the fisheries (section 3.3 of the FMEP). The public is involved in the development of fisheries regulations in ocean, mainstem, and tributary fisheries affecting the LCR ESU. This involvement allows the public to gain a better understanding of the fisheries management process. In addition, ODFW has a public involvement process to inform anglers of fishing regulations and the proper techniques for catching and releasing fish. The management area specified in the FMEP is under the sole regulatory jurisdiction of ODFW.

4(i)(H) Includes restrictions on resident and anadromous species fisheries that minimize any take of listed species, including time, size, gear, and area restrictions.

The fisheries within the Management Area specified in the FMEP (section 1.2.1) include many fishing restrictions specifically designed to control impacts on juvenile and adult spring chinook salmon. In the future, if there are proposals to change existing angling regulations, ODFW, will first confer with NOAA Fisheries before adoption, as stated in the FMEP, and in section 223.203 (4)(iii) of the 4(d) Rule for LCR chinook salmon.

4(i)(I) Is consistent with other plans and conditions established within any Federal court proceeding with continuing jurisdiction over tribal harvest allocations.

There are no Federal court proceedings with continuing jurisdiction over tribal harvest allocations that are relevant to the implementation of the FMEP with respect to LCR chinook salmon.

(4)(ii) The state monitors the amount of take and provides to NOAA Fisheries a report on a regular basis.

As described in section 3.5.1 of the FMEP, ODFW will assess compliance with the provisions of the FMEP annually. The runs of spring and fall chinook salmon will be monitored every year

with further restrictions to the fisheries made inseason in years that thresholds are not expected to be achieved.

Annual reports, which summarize how the previous year's fishery and natural fish runs performed relative to the standards and guidelines specified in the FMEP, will be provided to NOAA Fisheries by March 31st of each year.

(4)(iii) The state confers with NOAA Fisheries on its fishing regulation changes

As stated in section 3.5.1 of the FMEP, ODFW will confer with NOAA Fisheries on any fishing regulation changes that may affect listed chinook salmon in the Lower Columbia River Basin. Information on the proposed regulation change will be provided at least 2 weeks in advance of the decision being made.

(4)(iv) Written concurrence

If the determination is made that the FMEP adequately addresses all of the criteria specified in limit 4 of the 4(d) Rule, NOAA Fisheries will issue a letter of concurrence to ODFW, which will specify the necessary implementation and reporting requirements.

Processing of the Public Comments Received

As required in (4)(iii) of section 223.203 of the 4(d) Rule, before a FMEP can be approved or amended, the public must have had an opportunity to review and comment on the FMEP. A Notice of Availability and Request for Comment on the LCR FMEP was published on May 29, 2001 (65 FR 42422). NOAA Fisheries received one comment on the FMEP. Below is a discussion of the comment received and its response.

Comment One: One commentor was concerned about a directed fishery on ESA-listed fall chinook in the Sandy River. Since there are no hatchery fall chinook on the Sandy river, a fishery on chinook would be a directed fishery on an ESA-listed fish. The commentor was also concerned about incidental catch of fall chinook salmon in the hatchery coho salmon fishery. It was suggested that each river population be evaluated to determine whether the incidental harvest associated with the coho fishery supports the recovery of that population.

Response: NOAA Fisheries agrees, and both of these issues are addressed in the FMEP. As of 2002, there will be no retention of natural chinook salmon in the Sandy River. Only adipose fin clipped chinook salmon may be retained from February 1st through October 31st. Furthermore, fall chinook in the Sandy River are protected by closing areas where fall chinook hold and spawn and by closing the coho fishery on October 31st. The encounter rate of fall chinook salmon in the coho fishery will be monitored in all Lower Columbia River tributaries, and the associated catch and release mortality will be included in annual total harvest rates for fall chinook salmon.

Average annual harvest rates for tule fall chinook must be within RERs determined by the PFMC, and annual harvest rates for bright fall chinook must ensure that Lewis River escapement is met. If annual harvest rates are expected to exceed these levels, additional fishery constraints will be implemented.

RECOMMENDED DETERMINATION

As evaluated above, the Salmon Recovery Division recommends that the Regional Administrator determine that the FMEP for fisheries potentially affecting ESA-listed Columbia River chinook salmon submitted by ODFW adequately addresses all of the criteria established for limit #4 of the 4(d) Rule. If the RA so finds and approves the FMEP, the take prohibitions would not apply to fisheries implemented in accordance with the approved FMEP and NOAA Fisheries' letter of concurrence.

Literature Cited

Marshall, A.R., C. Smith, R. Brix, W. Dammers, J. Hymer, and L. LaVoy. 1995. Genetic Diversity Units and major ancestral lineages for chinook salmon in Washington. *In* C. Busack and J. B. Shaklee (eds.), Genetic diversity units and major ancestral lineages of salmonid fishes in Washington, p. 111-173. Washington Department of Fish and Wildlife Technical Report RAD95-02. Olympia, Washington.

McElhany, P., M.H. Rucklelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. NOAA Technical Memorandum NMFS-NWFSC-42. Seattle, Washington.

Myers, J.M., and 10 co-authors. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U. S. Depart. of Com., NOAA Tech. Memo. NMFS-NWFSC-35. Seattle, Washington.

Myers, J.M., C. Busack, D. Rawding, and A. Marshall. 2002. Identifying historical populations of chinook and chum salmon and steelhead within the Lower Columbia River and Upper Willamette River Evolutionarily Significant Units. May 10, 2002 Co-manager Review Draft. Willamette/Lower Columbia River Technical Recovery Team.

NMFS (National Marine Fisheries Service). 2000a. Endangered Species Act section 7 consultation. Biological opinion on impacts of Treaty Indian and non-Indian year 2000 winter, spring, and summer fisheries in the Columbia River basin, on salmon and steelhead listed under the Endangered Species Act. February 29, 2000.

NMFS. 2000b. Biological assessment for the operation of hatcheries funded by the National Marine Fisheries Service under the Columbia River Fisheries Development Program. March 17, 2000.

NMFS. 2000c. Endangered Species Act Section 7 consultation. Biological opinion on approval of the Pacific Salmon Treaty by the U. S. Department of State and Management of the Southeast Alaska salmon fisheries subject to the Pacific Salmon Treaty. April 28, 2000.

NMFS. 2000d. Endangered Species Act Section 7 consultation. Biological opinion on effects of Pacific Coast ocean and Puget Sound fisheries during the 2000-2001 annual regulatory cycle.

ODFW. 2001. Fisheries Management and Evaluation Plan. Upper Willamette River spring chinook in freshwater fisheries of the Willamette basin and Lower Columbia River mainstem. Portland, Oregon.

ODFW. 2003. Fisheries Management and Evaluation Plan for Lower Columbia River Chinook in Oregon Freshwater Fisheries of the Lower Columbia River Tributaries Between the Pacific Ocean and Hood River. Portland, Oregon.

Simmons, D. 2002. Revised RER for Coweeman River Natural Tule Fall Chinook. Memorandum from D. Simmons to W. Robinson, Assistant Regional Administrator for Sustainable Fisheries. NOAA Fisheries. Seattle, Washington.

WDFW (Washington Department of Fish and Wildlife). 2003. Fisheries management and Evaluation Plan. Lower Columbia River. March 31, 2003. Submitted to NMFS. Portland, Oregon.